Cypraecassis chipolana, a new species (Gastropoda: Cassidae) from the Miocene Chipola Formation of northwestern Florida

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ABSTRACT

A new fossil gastropod of the family Cassidae, *Cypraecassis chipolana*, is described from the lower Miocene Chipola Formation of northwestern Florida. *Cypraecassis chipolana* appears to be the only known Miocene *Cypraecassis sensu stricto* from the Americas. The new species most closely resembles the Recent *Cypraecassis wilmae* Kreipl and Alf, 2000, a species endemic to tropical west America.

Additional key words: Tertiary, Neogene, fossil.

INTRODUCTION

The family Cassidae has its earliest known record in the lower Eocene. During the Miocene the family had become established throughout the warm and temperate seas of the world (Abbott, 1968). While members of the Cassidae are not uncommon in both the Recent and the fossil record, only one species of the genus most closely related to *Cypraecassis*, *Cassis delta* Parker, 1948, has previously been identified from the lower Miocene Chipola Formation of northwestern Florida. Complete or fragmentary specimens of *Cassis delta* are found in many portions of the Chipola Formation both at Tennile Creek (the type locality) and along the Chipola River. The new species is known from a single specimen, collected on the Chipola River.

The Miocene Chipola Formation correlates in age with the Burdigalian of Europe (Vokes, 1965). Three valid species of the genus *Cypraecassis sensu stricto* have been described from the Miocene of Europe: *C. cypraeiformis* (Borson, 1820); *C. suberumena* (d'Orbigny, 1852); *C. subtesticulus* (d'Orbigny, 1852); and one from the Miocene of East Africa, *C. pustulata* (Cox, 1927) (Abbott, 1968).

Three Recent *Cypraecassis sensu stricto*, *C. tenuis* (Wood, 1928) and *C. wilmae* from the eastern Pacific Ocean, and *C. testiculus* (Linnaeus, 1758) from the Atlantic Ocean, are known to exist in the Western Hemisphere. *Cypraecassis testiculus* also occurs in the Pleistocene of Barbados and Cuba (Weisbord, 1962) and in the Miocene of the Dominican Republic (Gabb, 1873; Pilsbry, 1922). Jung (1971) reported three incomplete specimens of an undescribed *Cypraecassis* from the Miocene Grand Bay Formation of Carriacou, West Indies. This latter taxon is morphologically similar to and may be the predecessor of *Cypraecassis testiculus senegalica* (Gmelin, 1791) from West Africa. *Cypraecassis rufa* (Linnaeus, 1758) occurs in the Indo-Pacific Region from East Africa to eastern Polynesia (Abbott, 1968).

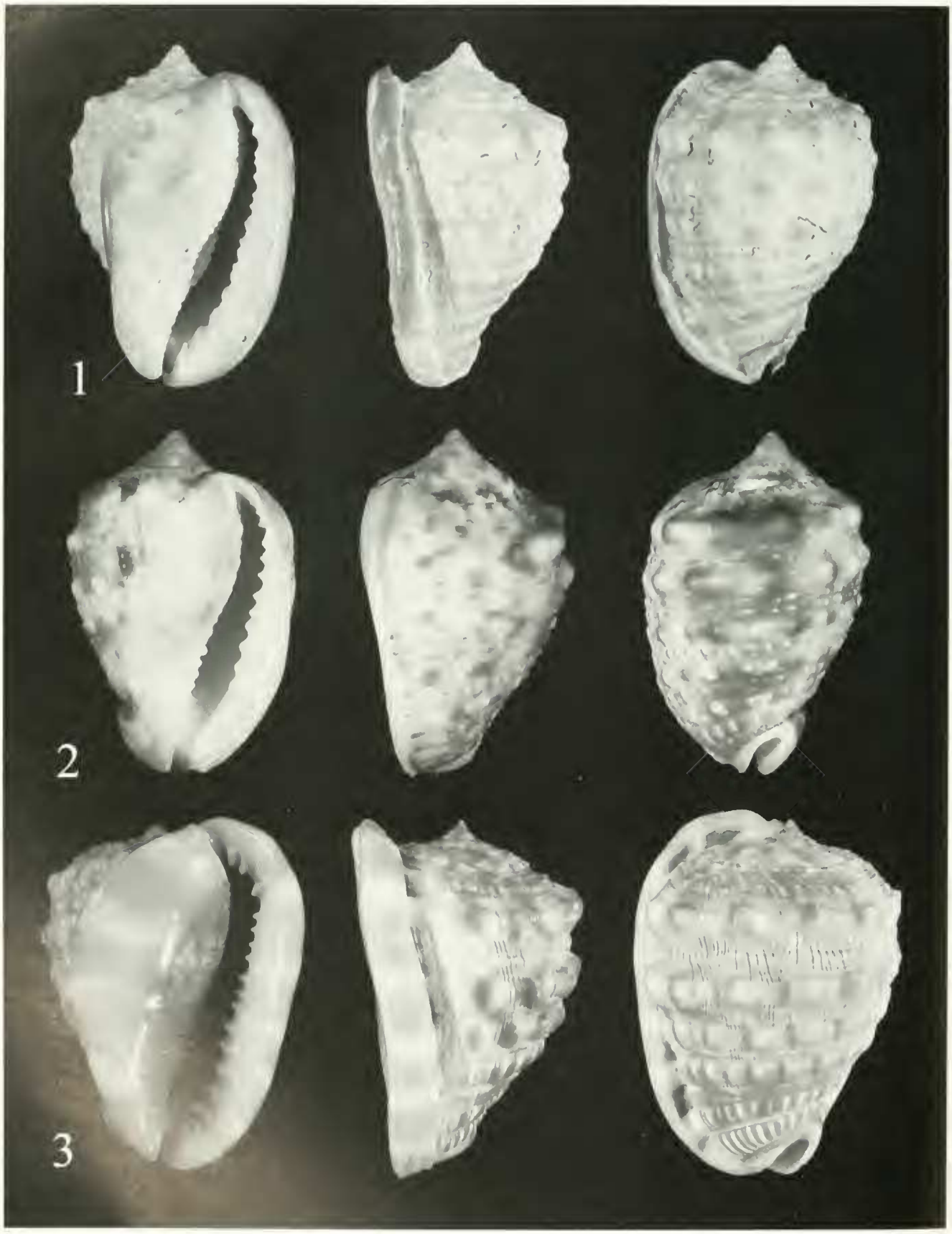
The holotype of *Cypraecassis chipolana* is deposited in the collection of the Department of Paleobiology, National Museum of Natural History (USNM), Smithsonian Institution, Washington, DC, USA.

SYSTEMATICS

Class Gastropoda Cuvier, 1797
Superfamily Tonnacea Peile, 1926
Family Cassidae Swainson, 1832
Genus *Cypraecassis* Stutchbury, 1837
Subgenus *Cypraecassis* Stutchbury, 1837

Cypraecassis (*Cypraecassis*) *chipolana* new species
(Figure 1)

Description: Shell thick, biconical, length (holotype) 57.4 mm, width 36.2 mm. Whorls about 7 including about 3 (somewhat damaged) protoconch whorls. Spire sculpture of evenly spaced rounded pustules on inner edge of suture and a raised cord with narrow, elongate knobs. Suture slightly impressed. Dorsal sculpture consisting of 4 rows of spiral bands of 10–11, fairly rounded nodules, largest at shoulder and decreasing in size anteriorly, disappearing entirely on anterior third of dorsum. Bands of nodules interspersed with one row of greatly reduced nodules, approximately 36 on posterior row, decreasing in number and becoming 3 rows of elongate ribs covering foremost third of dorsum. Parietal shield broad, thick, elevated posteriorly at commissure with labrum; posterior canal a narrow, shallow depression. Apertural portion of parietal wall containing about 30 narrow lirations of varying lengths, crossing an axial swelling or ridge (Figure 1) on columellar wall and extending into aperture. Anterior third of parietal wall and shield slightly raised, with enlarged lirations. Anterior



Figures 1–3. Species of *Cypraecassis* in apertural, lateral, and abapertural views. **1.** *Cypraecassis chipolana*, new species, holotype USNM 517892, length 57.1 mm, width 36.2 mm, from Chipola River, 30°28.135′ N, 85°09.538′ W. **2.** *Cypraecassis wilmae* Kreipl and Alf, 2000, Emilio Garcia Collection 18563, length 35.7 mm, width 24.6 mm, from Islas Secas, Golfo de Chiriqui, dredged, 120–240 m, sand/shell bottom. **3.** *Cypraecassis rufa* (Linnaeus, 1758), length 82.5 mm, width 57.2 mm, Indo-Pacific Region, Phyllis Diegel Collection, for comparison with *Cypraecassis chipolana*.

siphonal canal opening on right side of shell (in dorsal view), reflexed, deep, with chipped edge. True and false umbilicus (see Kreipl, 1997: 9) present; true umbilicus open and deep, false umbilicus closed. Outer lip thick, extending slightly into aperture and recurved upward over dorsum. Inner portion of labrum with approximately 17 single or paired stout lirations.

Type locality: Chipola River, 30°8.135′ N, 85°09.558′ W (= Tulane University locality TU 950, Chipola Formation, Chipola River, west bank about 600 m above Farley Creek (SW 1/4 Sec. 20, T1N, R9W), Calhoun County, Florida).

Type material: Holotype, USNM (Paleobiology) 517892, length 57.4 mm, width 36.2 mm.

Etymology: Named for the Chipola River, on which the type locality is situated.

Discussion: The Miocene European *Cypraeocassis* may be easily separated from *C. chipolana* by the presence in the former of rib-like longitudinal plications on the dorsal surfaces of the shells or, in one species, by a smooth dorsum. The Miocene *C. pustulata* of East Africa, as the name implies, has a dorsal sculpture of much larger pustules, arranged in a different pattern than those of *C. chipolana*. *Cypraeocassis chipolana* is separated from the Recent eastern Pacific *C. tenuis* by the larger, thinner shell, diaphanous parietal shield, and deeper posterior canal of *C. tenuis*. The Miocene *C. chipolana* may be easily distinguished from the Miocene to Recent *C. testiculus testiculus* of the Caribbean Region by the reticulate sculpture on the dorsum, more rounded shoulder, and thinner parietal shield of the latter. The undescribed Miocene *Cypraeocassis* from Carriacou (Jung, 1971), which somewhat resembles the Recent *C. testiculus senegalica*, is differentiated from the new species by the prominent orthocline axial plicae and lack of nodules on the undescribed species. The Recent *Cypraeocassis rufa* (Figure 3), ranging from East Africa to eastern Polynesia, resembles *C. chipolana*, but differs from it by the much larger shell and more rounded parietal shield of *C. rufa*. *Cypraeocassis rufa* also lacks the raised portion, or swelling, on the anterior third of the parietal wall and shield of *C. chipolana*.

The species most similar to *C. chipolana* is the Recent *C. wilmae* (Figure 2), but that species has one more band of spiral knobs on the body whorl; has 8 or 9 knobs per band as opposed to 10 or 11 on *C. chipolana*; has a more rounded parietal shield; and lacks the axial swelling or ridge on the columellar wall of *C. chipolana*. On *C. wilmae*, the bands of large knobs are separated by two rows of smaller knobs or beads compared to one row on *C. chipolana*.

Features that are common to *C. chipolana* and *C. wilmae* include similar overall shapes, small adult sizes, and the unusual diagonal separation on the anterior third of the columellar callus. On the basis of morphological similarities, the possibility exists that *C. chipolana* may be the ancestor of the Recent *C. wilmae*, which became isolated in the tropical eastern Pacific with closing of the Isthmus of Panama during the middle Pliocene (Cronin et al., 1984: 43).

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